



PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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| In re Application of: |) | |
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| Young Man KIM et al. |) | Confirmation No. 4827 |
| |) | |
| Application No.: 10/606,832 |) | Art Unit: 2629 |
| |) | |
| Filed: June 27, 2003 |) | Examiner: S. Sherman |
| |) | |
| For: INVERTER DEVICE, LIQUID CRYSTAL |) | Mail Stop Appeal Brief - Patents |
| DISPLAY DEVICE USING THE |) | |
| INVERTER DEVICE, AND METHOD OF |) | |
| MONITORING LAMPS OF THE LIQUID |) | |
| CRYSTAL DISPLAY DEVICE USING |) | |
| THE INVERTER DEVICE |) | |

Commissioner for Patents
U.S. Patent and Trademark Office
Mail Stop Appeal Brief - Patents
Alexandria, VA 22314

APPELLANTS' BRIEF UNDER 37 C.F.R. § 41.37

This brief is in furtherance of the Notice of Appeal, filed in the above-identified patent application on September 8, 2006. The period for reply to which extends to November 8, 2006. In addition, the fee set forth under 37 C.F.R. § 41.20(b)(2) is being filed concurrently herewith.

1. **The Real Party In Interest**

The real party in interest in this appeal is LG.Philips LCD Co, Ltd. of Seoul, Korea.

2. **Related Appeals and Interferences**

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Appellants are not aware of any other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the appeal.

3. **Status of Claims**

The status of the claims is as follows:

Claims rejected: 1-7, 9-16, and 18-24
Claims objected to: 8 and 17.
Claims allowed: none.
Claims withdrawn: none.
Claims canceled: none.
Claims appealed: 1-24.

4. **Status of Amendments**

All Amendments have been entered to date. On April 21, 2006, Appellants filed an Amendment in response to the Office Action dated January 23, 2006. Most recently, a Request for Reconsideration Under 37 C.F.R. § 1.116 was filed on August 4, 2006 in response to the Final Office Action dated May 9, 2006. Subsequently, the Examiner issued an Advisory Action on August 15, 2006, which indicated that the Request for Reconsideration Under 37 C.F.R. § 1.116 has been considered but does NOT place the application in condition for allowance. Appellants filed a Notice of Appeal on September 8, 2006. Accordingly, appealed claims, as presented in the Amendment filed on April 21, 2006, are attached as Claims Appendix to this brief.

5. **Summary of the Claimed Subject Matter**

An aspect of Appellants' present invention relates generally to an inverter device, a liquid crystal display device using the inverter device, and a method of monitoring lamps of a liquid crystal display device using the inverter device.

Independent Claim 1

With respect to independent claim 1, as discussed in Appellants' specification beginning at paragraph [0027] on page 8 and shown in FIGs. 5, 6, and 7, an inverter device for a liquid crystal display includes a transformer 122 for receiving an inverter drive voltage V_{in} , converting the received drive voltage V_{in} into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path HIGH of one of a plurality of backlight lamps 116, 118, and 120, a low path switching part 124 selectively connecting low paths LOW of the plurality of backlight lamps 116, 118, and 120 with a ground voltage source GND in response to an external inverter ON/OFF signal INVERTER ON/OFF SIGNAL, and a shutdown circuit 126 for receiving a voltage input through the low paths LOW of the plurality of backlight lamps 116, 118, and 120 to monitor for a malfunction of the one of the plurality of backlight lamps 116, 118, and 120 in response to an external shutdown ON/OFF signal SHUT DOWN ON/OFF SIGNAL.

Independent Claim 9

With regard to independent claim 9, as discussed in Appellants' specification beginning at paragraph [0027] on page 8 and shown in FIGs. 5, 6, and 7, a backlight lamp monitoring device for a liquid crystal display includes a plurality of backlight lamps 116, 118, and 120, and a plurality of inverters 110, 112, and 114, each receiving an inverter drive voltage V_{in} , converting the received drive voltage V_{in} into an AC lamp drive voltage, and supplying the AC lamp drive voltage to a high path HIGH of each of the backlight lamps 116, 118, and 120, wherein the inverters 110, 112, and 114 selectively connect a low path LOW of each of the backlight lamps 116, 118, and 120 with a ground voltage source GND in response

to an external inverter ON/OFF signal INVERTER ON/OFF SIGNAL, and the inverters 110, 112, and 114 receive a voltage input through the low path LOW of the backlight lamp 116, 118, and 120 to perform a shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp 116, 118, and 120 in response to an external shutdown ON/OFF signal SHUT DOWN ON/OFF SIGNAL.

Independent Claim 18

With regard to independent claim 18, as discussed in Appellants' specification beginning at paragraph [0027] on page 8 and shown in FIGs. 5, 6, and 7, a method for monitoring backlight lamps 116, 118, and 120 of a liquid crystal display includes receiving an inverter drive voltage V_{in} , converting the received drive voltage into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path HIGH of one of the backlight lamps 116, 118, and 120, selectively connecting a low path LOW of each of the backlight lamps 116, 118, and 120 with a ground voltage source GND in response to an external inverter ON/OFF signal INVERTER ON/OFF SIGNAL, and receiving a voltage input through the low path LOW of the one of the backlight lamps 116, 118, and 120 to monitor for a malfunction of the one of the backlight lamps 116, 118, and 120 in response to an external shutdown ON/OFF signal SHUTDOWN ON/OFF SIGNAL.

6. Grounds of Rejection To Be Reviewed On Appeal

Claims 1-7, 9-16, and 18-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Payne (US 5,420,779) in view of Ito et al. (US 2002/0021097) and Lin et al. (US 2003/0001524).

7. Argument

(i) Rejections under 35 U.S.C. § 112, first paragraph

No claims are presently rejected under 35 U.S.C. § 112, first paragraph.

(ii) Rejections under 35 U.S.C. § 112, second paragraph

No claims are presently rejected under 35 U.S.C. § 112, second paragraph.

(iii) Rejections under 35 U.S.C. § 102

No claims are presently rejected under 35 U.S.C. § 102.

(iv) Rejections under 35 U.S.C. § 103

Claims 1-7, 9-16, and 18-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Payne (US 5,420,779) in view of Ito et al. (US 2002/0021097) and Lin et al. (US 2003/0001524). Appellants respectfully traverse this rejection as being based upon references that neither teach nor suggest the combination of features recited by independent claims 1, 9, and 18, and hence dependent claims 2-8, 10-17 and 19-24.

The Final Office Action admits that “Payne fails to teach of an inverter device for a liquid crystal display comprising a low path switching part selectively connecting a low path of the backlight lamp with a ground voltage source in response to an external inverter ON/OFF signal.” Accordingly, the Final Office Action relies upon Ito et al. for allegedly teaching a lighting circuit. Thus, the Final Office Action concludes that it would have been obvious to combine Payne with the teachings of Ito et al. “in order to enhance safety by reducing the difference in electric potential of the voltage supply line with respect to the ground electric potential.” Appellants respectfully disagree.

First, Appellants respectfully assert that Ito et al. explicitly discloses, in FIG. 4, that a DC-AC conversion circuit 4 actually produces an alternating voltage between 0V and 350V, and is supplied to the electric discharge lamp 6 with the secondary winding 8b of the transformer 8. In addition, Ito et al. explicitly discloses (paragraph [0052]) that by using the circuit shown in FIG. 4, it is sufficient to supply a voltage lower than the ground electrical potential, and thus, the safety of the lighting circuit can be enhanced and the manufacturing costs can be reduced. However, according to Ito et al., the low path of the electric discharge lamp 6 is not selectively connected to a ground voltage source. Thus, Appellants respectfully assert that Ito et al. fails to remedy the deficiencies of Payne in order to establish a *prima facie* case of obviousness.

Second, Appellants respectfully assert that the alleged motivation of enhancing “safety by reducing the difference in electric potential of the voltage supply line with respect to the ground electric potential” is simply not taught by Ito et al. Specifically, as detailed above, Ito et al. makes use of the bridge-type DC-AC conversion circuit 4 to provide an alternating voltage to be supplied to a secondary winding of a transformer 8. Accordingly, Appellants respectfully assert that the alleged motivation attributed to Ito et al. does not exist. Thus, Appellants respectfully assert that Ito et al. further fails to remedy the deficiencies of Payne in order to establish a *prima facie* case of obviousness.

Third, Appellants respectfully assert that combining the teachings of Ito et al. with the circuit structure of Payne would result in changing the principle of operation of Payne, thus rendering the circuit of Payne unsatisfactory for its intended purpose. For example, as shown throughout Payne, the circuitry 10 includes a voltage inverter 11 that transforms the DC voltage obtained from the bus 14 into an AC voltage for illuminating cold cathode fluorescent

lamp 12 via connections 107 and 108. In contrast, Ito et al. explicitly requires use of the bridge-type DC-AC conversion circuit 4 to provide an alternating voltage to be supplied to a secondary winding of a transformer 8. Accordingly, Appellants respectfully assert that modifying circuitry of Payne with the teachings of Ito et al. would prevent the circuitry of Payne from its principle of operation, and thus, not function properly.

As MPEP 2143.01 instructs, “[I]f proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).” Furthermore, MPEP 2143.01 instructs, “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).” Accordingly, because modifying Payne with the teachings of Ito et al. would change the principle operation of Payne, i.e., render the function of the voltage inverter circuit 11 of Payne inoperable and unsatisfactory for its intended purpose, Appellants respectfully assert that the Final Office Action has not established any proper motivation to modify Payne, and thus not established a *prima facie* case of obviousness.

Fourth, as admitted by the Final Office Action, with regard to independent claims 1 and 18, “Payne and Ito et al. fail to teach of an inverter device for a liquid crystal display, comprising: a plurality of backlight lamps.” Accordingly, the Final Office Action apparently relies upon Lin et al. for allegedly teaching backlight lamps interconnected between driving and feedback circuits. Thus, the Final Office Action concludes that it would have been

obvious to combine the teachings of Lin et al. with Payne and Ito et al. “in order to provide a plurality of lamps in a device.” Appellants respectfully disagree.

Appellants respectfully assert that Lin et al. fails to provide proper motivation with which to modify Payne and/or Ito et al. Specifically, Appellants respectfully assert that both Payne and Ito et al. are explicitly directed toward controlling single discharge lamps, and consequently, Lin et al. fails to provide any motivation with which to modify Payne and/or Ito et al. to arrive at Applicant’s claimed invention. Moreover, although Lin et al. may disclose control circuitry for a plurality of discharge lamps, Lin et al. fails to provide any motivation, either implicitly or explicitly, with which to apply the multiple lamp control circuitry to a single discharge lamp, as explicitly disclosed by Payne and Ito et al.

In addition, Appellants respectfully assert that the driving circuits 10 and 20, as shown in FIG. 2 of Lin et al., fail to function to selectively connect low paths of the lamps Lp1 and Lp2 with a ground source, as required by independent claim 9. Accordingly, although Lin et al. may disclose control of multiple lamps Lp1 and Lp2 using an equal number of driving circuits 10 and 20, Appellants respectfully assert that Lin et al. is completely silent with regard to selectively connecting low paths of the lamps Lp1 and Lp2 with a ground source using the driving circuits 10 and 20.

Thus, for at least the above reasons, Appellants respectfully assert that the Final Office Action fails to establish a *prima facie* case of obviousness with regard to at least independent claims 1, 9, and 18.

With regard to independent claim 18, Appellants respectfully assert that the method recited by independent claim 18 is equally neither taught nor suggested by any of Payne, Ito et al., and/or Lin et al. Moreover, as previously pointed-out in Appellants’ Amendment filed

on April 21, 2006, the allegation that the combination of steps recited by independent claim 18 may be somehow implied by the structures shown in any of Payne, Ito et al., and/or Lin et al. is completely unsupported by any of Payne, Ito et al., and/or Lin et al.. Simply put, Appellants respectfully assert that the combination of features recited by at least independent claim 18 has yet to be properly addressed and examined, per MPEP 2144.08(III).

For at least the above reasons, since the Final Office Action fails to meet the requirements for establishing a *prima facie* case of obviousness as to independent claims 1, 9, and 18, claims 1, 9, and 18 are not obvious. Furthermore, since claims 2-7, 10-16, and 19-24 depend from claims 1, 9, and 18, respectively, and incorporate all the features of claims 1, 9, and 18, claims 2-7, 10-16, and 19-24 are not obvious at least for the above reasons for which independent claims 1, 9, and 18 are not obvious. Thus, Appellants respectfully request that the rejections of claims 1-7, 9-16, and 18-24 under 35 U.S.C. § 103(a) be withdrawn.

(v) Other Rejections


No claims are presently rejected under grounds other than those referred to above.

In view of the foregoing, Appellants respectfully request the reversal of the Examiner's rejection and allowance of the pending claims. If there are any other fees due in connection with the filing of this Appeal Brief, please charge the fees to our Deposit Account No. 50-0310.

If a fee is required for an extension of time under 37 C.F.R. §1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account No. 50-0310.

Respectfully submitted,

MORGAN LEWIS & BOCKIUS LLP

By: 
David B. Hardy
Reg. No. 47,362

Dated: November 8, 2006

Customer No. 009629
MORGAN LEWIS & BOCKIUS LLP
1111 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(202) 739-3000

8. **Claims Appendix**

Claim 1 (Previously Presented): An inverter device for a liquid crystal display, comprising:

a transformer for receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path of one of a plurality of backlight lamps;

a low path switching part selectively connecting low paths of the plurality of backlight lamps with a ground voltage source in response to an external inverter ON/OFF signal; and

a shutdown circuit for receiving a voltage input through the low paths of the plurality of backlight lamps to monitor for a malfunction of the one of the plurality of backlight lamps in response to an external shutdown ON/OFF signal.

Claim 2 (Previously Presented): The device according to claim 1, wherein the low path switching part includes:

a first driver selectively supplying the inverter drive voltage to the low paths of the plurality of backlight lamps in response to the inverter ON/OFF signal; and

a first switching part connecting the low paths of the plurality of backlight lamps to the ground voltage source in response to an output signal of the first driver.

Claim 3 (Original): The device according to claim 2, the first driver includes:

a first switch being switched in response to the inverter ON/OFF signal; and
a second switch supplying the inverter drive voltage to the first switching part
in response to a state of the first switch.

Claim 4 (Previously Presented): The device according to claim 3, wherein the first
switching part includes:

first and second field effect transistors connected in series between the low
paths of the plurality of backlight lamps and the ground voltage source for connecting
the low paths of the plurality of backlight lamps to the ground voltage source in
response to an output signal of the second switch; and

a resistor connected between the low paths of the plurality of backlight lamps
and the first field effect transistor.

Claim 5 (Previously Presented): The device according to claim 1, wherein the
shutdown circuit includes:

a second driver selectively supplying the inverter drive voltage to the low
paths of the plurality of backlight lamps in response to the shutdown ON/OFF signal;

a second switching part providing one of an enabling and disabling shutdown
function for monitoring for the presence or absence of a malfunction of the plurality
of backlight lamps in response to an output signal of the second driver; and

an error amplifier monitoring for the presence or absence of a malfunction of the plurality of backlight lamps when the shutdown function is enabled by the second switching part.

Claim 6 (Original): The device according to claim 5, wherein the second driver includes:

a third switch being switched in response to the shutdown ON/OFF signal; and
a fourth switch supplying the inverter drive voltage to the second switching part in response to a state of the third switch.

Claim 7 (Previously Presented): The device according to claim 6, wherein the second switching part includes:

third and fourth field effect transistors connected in series between the low paths of the plurality of backlight lamps and the ground voltage source for connecting the low paths of the plurality of backlight lamps to the ground voltage source in response to an output signal of the fourth switch; and

a resistor connected between the low paths of the plurality of backlight lamps and the third field effect transistor.

Claim 8 (Original): The device according to claim 7, wherein the second switching part includes:

a first capacitor connected between a drain terminal of the third field effect transistor and a drain terminal of the fourth field effect transistor; and

a second capacitor connected between the drain terminal of the fourth field effect transistor and the ground voltage source.

Claim 9 (Original): A backlight lamp monitoring device for a liquid crystal display, comprising:

a plurality of backlight lamps; and

a plurality of inverters, each receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage, and supplying the AC lamp drive voltage to a high path of each of the backlight lamps,

wherein the inverters selectively connect a low path of each of the backlight lamps with a ground voltage source in response to an external inverter ON/OFF signal, and the inverters receive a voltage input through the low path of the backlight lamp to perform a shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal.

Claim 10 (Original): The device according to claim 9, wherein each of the inverters includes:

- a transformer for receiving the inverter drive voltage (V_{in}), converting the received drive voltage into the AC lamp drive voltage, and supplying the AC lamp drive voltage to the high path of the backlight lamp;

- a low path switching part for selectively connecting the low path of the backlight lamp with the ground voltage source in response to the external inverter ON/OFF signal; and

- a shutdown circuit for receiving the voltage input through the low path of the backlight lamp to monitor for the presence or absence of a malfunction of the backlight lamp in response to the external shutdown ON/OFF signal.

Claim 11 (Original): The device according to claim 10, wherein the low path switching part includes:

- a first driver for selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the inverter ON/OFF signal; and

- a first switching part for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the first driver.

Claim 12 (Original): The device according to claim 11, wherein the first driver includes:

a first switch being switched in response to the inverter ON/OFF signal; and
a second switch for supplying the inverter drive voltage to the first switching part in response to a state of the first switch.

Claim 13 (Original): The device according to claim 12, wherein the first switching part includes:

first and second field effect transistors connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the second switch; and

a resistor connected between the low path of the backlight lamp and the first field effect transistor.

Claim 14 (Original): The device according to claim 10, wherein the shutdown circuit includes:

a second driver for selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the shutdown ON/OFF signal;

a second switching part for providing one of an enabling and disabling shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an output signal of the second driver; and

an error amplifier for monitoring for the presence or absence of a malfunction of the backlight lamp when the shutdown function is enabled by the second switching part.

Claim 15 (Original): The device according to claim 14, wherein the second driver includes:

a third switch being switched in response to the shutdown ON/OFF signal; and
a fourth switch for supplying the inverter drive voltage to the second switching part in response to a state of the third switch.

Claim 16 (Original): The device according to claim 15, wherein the second switching part includes:

third and fourth field effect transistors connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the fourth switch; and

a resistor connected between the low path of the backlight lamp and the third field effect transistor.

Claim 17 (Original): The device according to claim 16, wherein the second switching part includes:

a first capacitor connected between a drain terminal of the third field effect transistor and a drain terminal of the fourth field effect transistor; and

a second capacitor connected between the drain terminal of the fourth field effect transistor and the ground voltage source.

Claim 18 (Previously Presented): A method for monitoring backlight lamps of a liquid crystal display, comprising:

receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path of one of the backlight lamps;

selectively connecting a low path of each of the backlight lamps with a ground voltage source in response to an external inverter ON/OFF signal; and

receiving a voltage input through the low path of the one of the backlight lamps to monitor for a malfunction of the one of the backlight lamps in response to an external shutdown ON/OFF signal.

Claim 19 (Previously Presented): The method according to claim 18, wherein the step of selectively connecting a low path includes:

selectively supplying the inverter drive voltage to the low path of each of the backlight lamps in response to the inverter ON/OFF signal; and

connecting the low path of each of the backlight lamps to the ground voltage source in response to an output signal of the first driver.

Claim 20 (Previously Presented): The method according to claim 19, wherein the step of selectively supplying the inverter drive voltage includes:

switching a first switch in response to the inverter ON/OFF signal; and

supplying the inverter drive voltage to the low path of each of the backlight lamps in response to a state of the first switch.

Claim 21 (Previously Presented): The method according to claim 20, wherein the step of connecting the low path includes connecting the low path of the each of the backlight lamps to the ground voltage source in response to an output signal of the second switch.

Claim 22 (Previously Presented): The method according to claim 18, wherein the step of receiving a voltage input includes:

selectively supplying the inverter drive voltage to the low path of the each of the backlight lamps in response to the shutdown ON/OFF signal;

providing one of an enabling and disabling shutdown function for monitoring for the presence or absence of a malfunction of the one of the backlight lamps in response to an output signal of the second driver; and

monitoring for the presence or absence of a malfunction of the one of the backlight lamps when the shutdown function is enabled by the second switching part.

Claim 23 (Original): The method according to claim 22, wherein the step of selectively supplying the inverter drive voltage includes:

switching a third switch in response to the shutdown ON/OFF signal; and
supplying the inverter drive voltage to the second switching part in response to a state of the third switch.

Claim 24 (Previously Presented): The method according to claim 23, wherein the step of providing one of an enabling and disabling shutdown function includes connecting the low path of each of the backlight lamps to the ground voltage source in response to an output signal of the fourth switch.

9. **Evidence Appendix**

No information is appended under this section.

10. **Related Proceedings Appendix**

No information is appended under this section.